REMARKS

Claims 1 through 16 and 18 through 21 are in the application and are presented for consideration. By this Amendment, changes have been made to claims 1, 6, 18, 19 and 20.

Claims 1-16 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haczynski et al. (US Pat No. 5,866,874) in view of Tsutsumi (EP 1358973 A1).

It is Applicant's position that the prior art does not present teachings which render the claimed subject matter obvious. Applicant has noted that the rejection is at least partially based on the knowledge of Applicant's invention in considering features of the prior art and selecting them to meet the claimed combination. It is Applicant's position that the person of ordinary skill in the art is not presented with information which makes the claimed combination obvious.

The present invention is a welding torch device of a welding robot based on a combination of features including a structural arrangement in which the welding torch device is divided into a stator and a rotor. The rotor is rotatably arranged with respect to the stator. The rotor as well as the stator is provided with interfaces for fastening the device at the robot and for fastening a welding torch to the welding torch device. The welding torch device is provided with an electrical current transfer device in order to transfer current through the welding torch device and to transfer the current between the stationary stator and the rotating rotor. The stator is provided with an essentially centrically leadthrough for leading supply material to the welding point. As such, the stator of the welding torch device is an inner stator which is surrounded by an outer rotor. The rotor is rotatable about the rotational axis as well

as about the stator. The rotational axis of the rotor is essentially aligned (in line with, coaxial) with the rotational axis of the connection device of the robot.

These features have been further clarified in the claims as now presented. Support for these features can be found in paragraphs [0032], [0033], [0036] and [0038] of the substitute specification (see also US 2007/0000894 A1). Paragraph [0032] describes that the stator has a tubular leadthrough 14, arranged centrally in the welding torch device. A longitudinal axis 16 of the leadthrough 14 is aligned with the longitudinal axis 16 of the connection flange 6 of the robot arm 3. According to paragraph [0033] the leadthrough 14 is surrounded by another part of the stator 1, namely a bell-shaped section 23. According to paragraph [0036] and [0037], the leadthrough 14 and the bell-shaped section 23 are surrounded by a multipart, hollow-cylinder-type housing 39 of the rotor, which varies in cross section. The rotor includes another hollow cylinder 41, which extends up to an end flange 42 of the stator. In paragraph [0038] it is described, that the rotor with its hollow-cylinder 41 and other parts can transfer the rotational drive motion of robot´s connection flange around the rotational axis 8 of the connection flange 6 of the robot and around the fixing device of the welding torch device to the welding torch. As is also shown in Fig. 3 the inner stator is surrounded by the outer rotor and the rotor is rotatable around/about the inner stator.

Claim 18 as previously presented did already require that "the rotor is rotatable about the rotational axis as well as about the stator". In the Final Office Action on page 9 it is stated that these features are disclosed by Tsutsumi in Fig. 1. However, in the device disclosed by Tsutsumi, the rotor is denoted with 6 and the stator is denoted with 1. Further, in paragraph

[0024] it is mentioned that the rotor 6 is coupled to and supported by the stator for rotation with 360 degrees or more. Clearly inner rotor 6 is the rotatable structure and outer stator 1 is stationary Tsutsumi denotes therefore rotor and the stator elements with more or less corresponding functionality to the rotor and the stator of the present invention. The rotor rotates and the stator is stationary. As can be seen particularly in Fig. 1, in the device disclosed by Tsutsumi, the rotary joint has a rotor 6 that is within the rotary joint and is the nearest element to the rotary axis. Rotor 6 is surrounded by means of the stator 1 (the stationary element), which is clearly arranged as outer element of the both element. Therefore, Tsutsumi clearly discloses a rotary joint having a solution which is contrary to the present invention.

According to the present invention as claimed, the stator is surrounded by the rotor and the rotor rotates around the stator. Since Haczynski et al does not disclose a system of rotor/stator the only possibility for using a prior known rotor/stator system is to use a rotor/stator solution as disclosed by Tsutsumi. As pointed out, this may be considered a combination based on hindsight. However, this would not result in a combination of features as claimed. Therefore, even with a hindsight approach in which features from the prior art are selected to achieve the claimed combination, a selection of features from Tsutsumi and Haczynski does not result in a combination of features as claimed including the inner stator and the outer rotor of the present invention.

Applicants dependent claims further highlight that the stator is provided with a current transfer device having an electrical connection for the welding power cable. This connection current transfer device is lead through the fixing device with which the welding torch device

is attached to the connection device 6 of the robot. With this the rotational axis, with which the rotor is rotatable, is at least essentially aligned (in line with, coaxial) to the rotational axis of the connection device.

According to the present invention the welding torch device is provided with a fixing device with which the welding torch device is attached to the connection flange of the robot (paragraph [0009]). The welding torch device is also provided with a current transfer device, to which the electric power cable is connected and which is guided through the fixing device [0010] with its centrally rotational axis. The stator (stationary part – as to the connected robot) is guided through the fixing device (paragraph [0010]), whereby the fixing device 9, as part of the rotor, can be rotated about the rotational axis 8 (paragraph [0031]). For this purpose the stator is provided with a centrally connection for the power cable (paragraph [0010], [0032]). The inner stator feature is important to achieve the power connection. The power cable is therefore connected to the current transfer device of the welding torch device (paragraph [0032]). The stator with its connection is completely guided through the fixing device (in the interior of the fixing device). According to paragraph s [0008], [0030] and [0032] the rotational axis 8 is coaxially aligned and identical with the rotational axis of the connection device/flange 6 of the robot. Therefore, as result, the current transfer device is lead through the fixing device with which the welding torch device is attached to the connection flange 6 of the robot, whereby the rotational axis with which the rotor is rotatable is coaxial to the rotational axis of the connection device.

It is not explicitly described how Tsutsumi´s rotary joint is connected to the robot.

However, since the upper flange 8 closes the channel of shaft 7 (see Fig. 1) of the inner rotor 6 completely and the entire stator 1 is clearly arranged underneath the upper flange 8 (fixing device) it is not possible that the power cable can be connected to the stator and be lead through the fixing device. Instead, in the device disclosed by Tsutsumi it is clearly described and shown that the power cable 25 is lead to a connection of the stator in a radial direction. The cable 25 extends in a radial manner from a side of the rotary joint and with a clear distance to the fixing device. The stator being an outer stator is essential to achieve the power connection. This fails to provide the advantages of the invention. Further, the prior art as a whole fails to suggest the crux of the invention. The present invention patentably defines over any combination of Haczynski et al. (US Pat No. 5,866,874) in view of Tsutsumi (EP 1358973 A1). Further, the prior art does not present teachings or suggestions which would lead the person of ordinary skill in the art to modify the device taught by Haczynski et al. with features taught by Tsutsumi. As noted, even if such a combination is made, the combination does not include all features claimed and does not achieve the advantages of the combination claimed.

The Final Office Action states in item 6 (on page 4), that Haczynski et al. discloses in col. 4, lines 6-52 and col. 6, lines 37-62 that a longitudinal axis of the leadthrough is aligned with the rotational axis of the connection device. Applicant is carefully considered these passages. According to Applicant's understanding these passages of Haczynski et al don´t disclose such a technical feature. The connection device is defined, in the present application, as that part of the robot, which executes the rotational motion and which can rotate in relation to the robot arm. In none of the cited passages of Haczynski et al is a connection device of the

robot described. Haczynski et al. only discloses, in connection with Fig. 6 and 7, a connection device for holding the welding torch device according Fig. 1-3. As such, this involves still a further holding and connection feature (see Figure 5). Haczynski´s connection device is denoted with 130 as a robotic mounting arm. The robotic mounting arm 130 holds the robotic welding torch at one of its ends in the area of robotic mount 16. At the other end robotic mounting arm 130 a collision sensor 160 is mounted which is usually attached to the robot. Therefore the robotic mounting arm 130 constitutes a radial distance to a collision sensor 160 and therefore to the end of the robot arm. The axis of rotation of the robot arm and therefore of Haczynski´s

connection device runs through the collision sensor 160 and not through the leadthrough of the welding torch device. The longitudinal axis of the leadthrough and the rotational axis of the connection device are not aligned (in line with each other). The rotational axis of the connection device is not even arranged in the area of the welding torch device, it has a clear distance to the leadthrough. Accordingly, the mounting arm 130 as described by Haczynski et al. corresponds to prior art solutions which are discussed in the present application in paragraph [0004]. Other solutions are not disclosed by Haczynski et al., particularly no solution which allows a leadthrough of the power cable and welding supply material through the connection flange of the robot so that the longitudinal axes of stator is in alignment with a rotational axis of the connection flange of the robot. In this way, the prior art including Haczynski et al. fails to teach the crux of the invention. Conventional robots can in principle be used for a welding torch device, but their flange would have to be prepared for this. The

Haczynski et al. reference neither discloses this problem nor discloses a solution therefore. It is therefore not accurate to consider that Haczynski et al discloses that the welding torch device of Haczynski et al is held by the robot at 16 with the connection device of the robot in alignment with the rotational axis of the connection device. As consequence Haczynski et al does not disclose a current transfer device that has an electrical connection for the welding power cable with this connection current transfer device lead through the fixing device with which the welding torch device is attachable to the connection flange 6 of the robot, whereby the rotational axis with which the rotor is rotatable is coaxially arranged to the rotational axis of the connection device.

As neither Haczynski et al. nor Tsutsumi disclose the claimed features alone or in combination, the rejection does not establish a prima facie case of obviousness.

The present invention has decisive advantages, particularly that it is now possible to arrange the power cable in a constructional easy manner in line with the rotational axis of the connection device of the robot and to arrange the welding gun in a rotatable manner. This makes it possible to arrange the power cable of the welding torch device in a non-rotable manner. This avoids the significant problem and related danger of torsion and twisting of the cable. Also wire material can be supplied. Wire necessary for MIG/MAG welding is lead through the cable and through the connection device without the danger of torsion problems. These advantages are directly related to and result particularly from the combination of features claimed as discussed above.

The device disclosed by Tsutsumi only concerns spot welding. This device does not

offer the possibility to feed welding wire to the welding gun. This presents a further obstacle with regard to the proposed combination. The person of ordinary skill in the art would not combine teachings from Tsutsumi with Haczyinski because they concern different welding methods and each present different issues and different related problems. The device disclosed by Tsutsumi relating to spot welding (page 4, line 25) presents conflicting technological concepts as compared to the device disclosed by Haczynski, which deals with MIG-welding (col. 1, lines 11-33) for which are different equipment is necessary.

Applicant notes that the rejection lists claim 19 as being rejected but does not present arguments details and with regard to the rejection of claim 19.

It is Applicant's position the claim 19 is also patentable for reasons similar to those noted above with regard to the independent claims including independent claim 18.

It is requested that each of the rejections be reconsidered in view of the claims as now presented and in view of the discussion above.

Further and favorable action on the merits is requested.

Respectfully submitted
for Applicant,

By:_____
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Attached: Petition for Three Month Extension of Time

SHOULD ANY OTHER FEE BE REQUIRED, THE PATENT AND TRADEMARK OFFICE IS HEREBY REQUESTED TO CHARGE SUCH FEE TO OUR DEPOSIT ACCOUNT 13-0410.

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